Data Analysis Nanodegree Program
Project 1 – Explore Weather Data

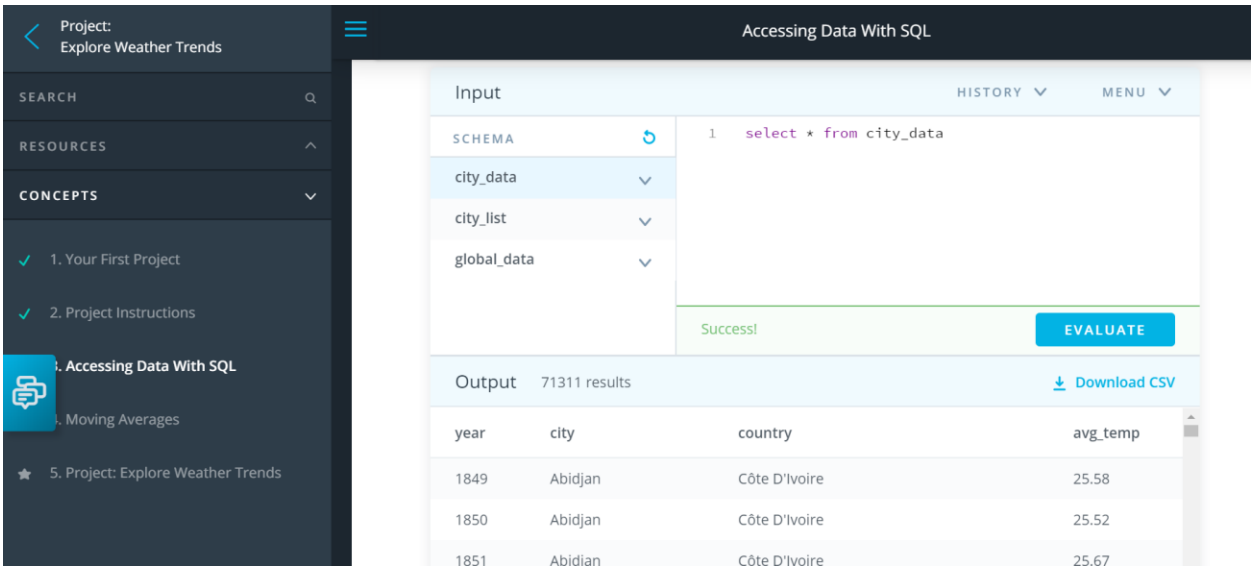
1.0 Data Retrieval

The following queries are used to get the data from my workspace. My closest city is Seattle.

Query #1: City Level Data Retrieval

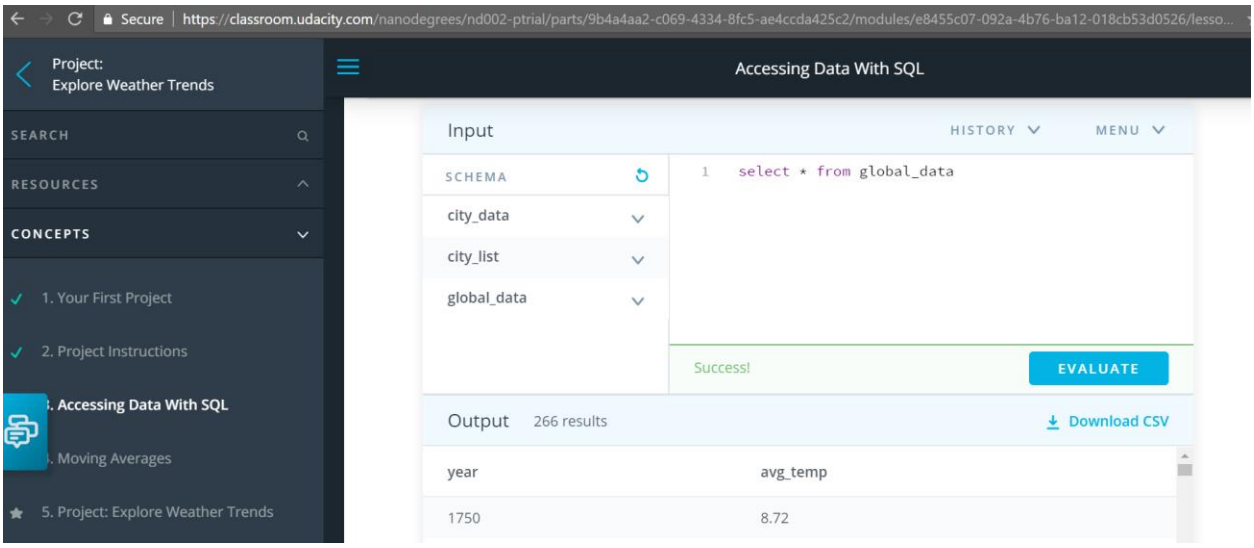
Select * from city_data

I could have used "**select * from city_data where city = 'Seattle'**", but I wanted to get the whole dump, so I can analysis different cities for learning purposes.



Query #2: Global Data Retrieval

Select * from global_data


Secure | https://classroom.udacity.com/nanodegrees/nd002-ptrial/parts/9b4a4aa2-c069-4334-8fc5-ae4ccda425c2/modules/e8455c07-092a-4b76-ba12-018cb53d0526/lesso...
Project:
Explore Weather Trends
SEARCH
RESOURCES
CONCEPTS
1. Your First Project
2. Project Instructions
. Accessing Data With SQL
. Moving Averages
5. Project: Explore Weather Trends
Accessing Data With SQL
Input
HISTORY
MENU
SCHEMA
city_data
city_list
global_data
1 select * from global_data
Success!
EVALUATE
Output
266 results
Download CSV
year
avg_temp
1750
8.72

2.0 Calculate Moving Average

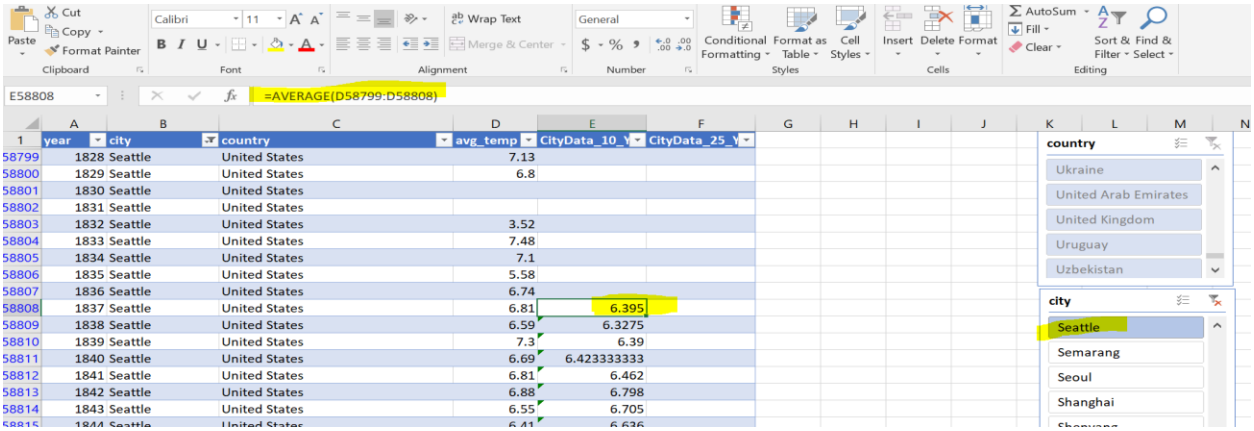
Moving Average is primarily used to smoothen the temperature results to make sure the data is not interpreted wrongly because of skews in temperature.

After storing all the data in one Excel file i.e. City temperature data in 'city_data' Work sheet, Global temperature data in 'global_data'.

I did the following steps to calculate the moving average on city data.

Steps:

1. Format the data in table format in 'city_data' worksheet.
2. Added Slicers for 'city' and 'country' to filter only the city, we are interested. My closest city is Seattle. In the slicer, I chose 'Seattle' to get only Seattle City Data.
3. To calculate Moving Average for over 10 years, in the new column [CityData_10_Years], I included the below formula '=AVERAGE(D58799:D58808)', and dragged the moving average formula for the rest of the year rows.
4. I also calculated Moving Average for over 25 years, in the new column [CityData_25_Years] to play with the data.

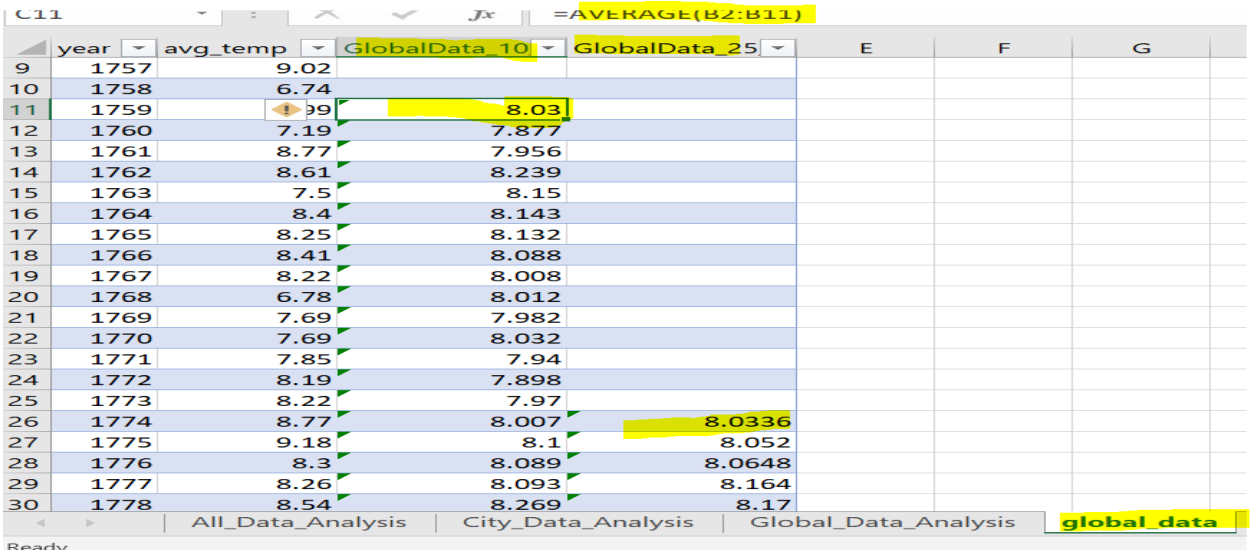


	year	city	country	avg_temp	CityData_10_Y	CityData_25_Y
58799	1828	Seattle	United States	7.13		
58800	1829	Seattle	United States	6.8		
58801	1830	Seattle	United States			
58802	1831	Seattle	United States			
58803	1832	Seattle	United States	3.52		
58804	1833	Seattle	United States	7.48		
58805	1834	Seattle	United States	7.1		
58806	1835	Seattle	United States	5.58		
58807	1836	Seattle	United States	6.74		
58808	1837	Seattle	United States	6.81	6.395	
58809	1838	Seattle	United States	6.59	6.3275	
58810	1839	Seattle	United States	7.3	6.39	
58811	1840	Seattle	United States	6.69	6.423333333	
58812	1841	Seattle	United States	6.81	6.462	
58813	1842	Seattle	United States	6.88	6.798	
58814	1843	Seattle	United States	6.55	6.705	

For computing Moving Average for global data, I followed the below steps:

1. Format the data in 'global_data' worksheet in Table format.
2. To calculate the Moving Average for over 10 years, I included a new formula '=AVERAGE(B2:B11)' in a new column [GlobalData_10_Years] and for calculating Moving Average for over 25 years, I included another formula '=AVERAGE(B2:B26)' in the new column

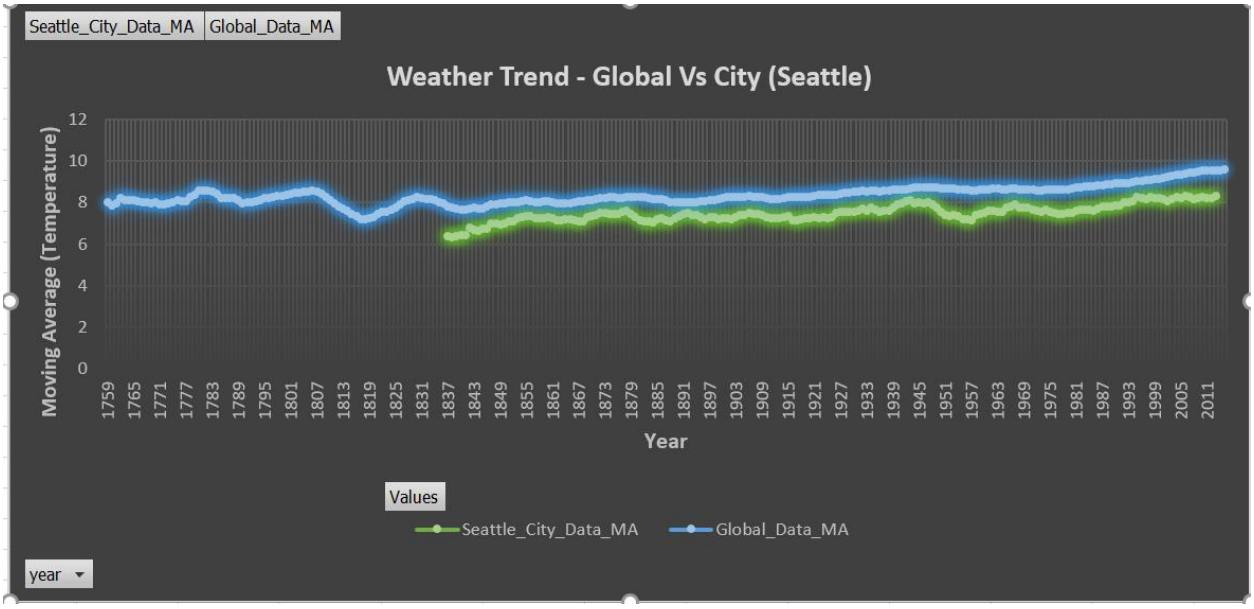
[GlobalData_25_Years].



	year	avg_temp	GlobalData_10	GlobalData_25	E	F	G
9	1757	9.02					
10	1758	6.74					
11	1759	99	8.03				
12	1760	7.19	7.877				
13	1761	8.77	7.956				
14	1762	8.61	8.239				
15	1763	7.5	8.15				
16	1764	8.4	8.143				
17	1765	8.25	8.132				
18	1766	8.41	8.088				
19	1767	8.22	8.008				
20	1768	6.78	8.012				
21	1769	7.69	7.982				
22	1770	7.69	8.032				
23	1771	7.85	7.94				
24	1772	8.19	7.898				
25	1773	8.22	7.97				
26	1774	8.77	8.007	8.0336			
27	1775	9.18	8.1	8.052			
28	1776	8.3	8.089	8.0648			
29	1777	8.26	8.093	8.164			
30	1778	8.54	8.269	8.17			

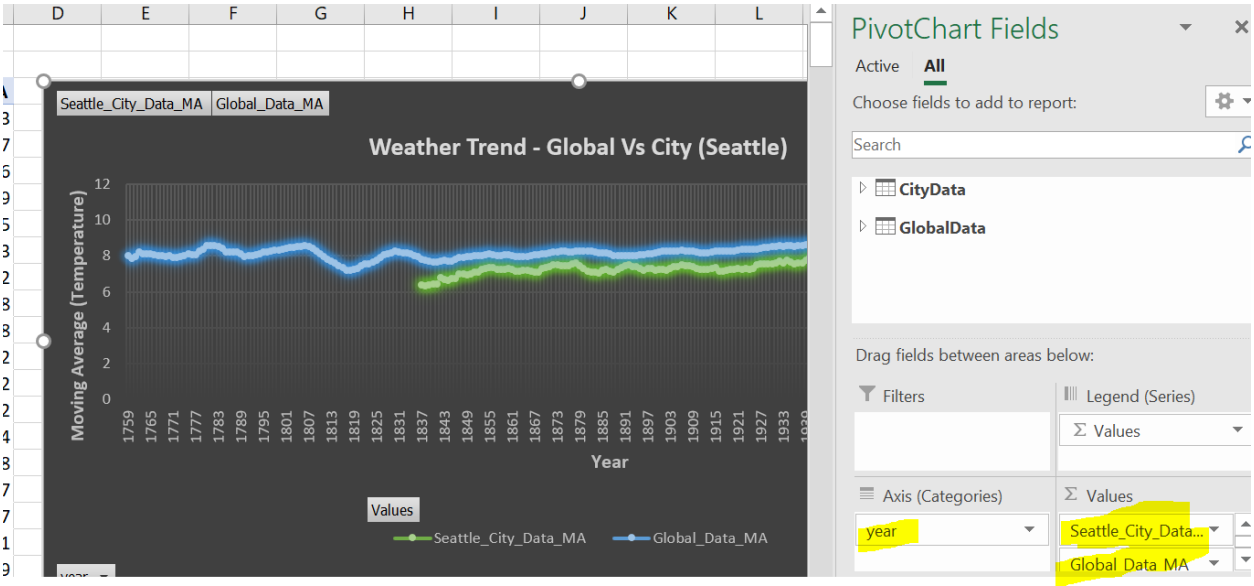
3.0 Chart Creation Process

To analyze the temperature trend between global and city data, I created the below chart.



Below are the steps I followed for creating the above charts:

1. Created Data Model with 'City data' table and 'Global Data' table.
2. Created a Pivot chart, by choosing 'Year' as an axis and chose 'City_Data_MA_10_Years' and 'Global_Data_10_Years'.



3. Added Axes titles, and chart title, as shown in the above chart.

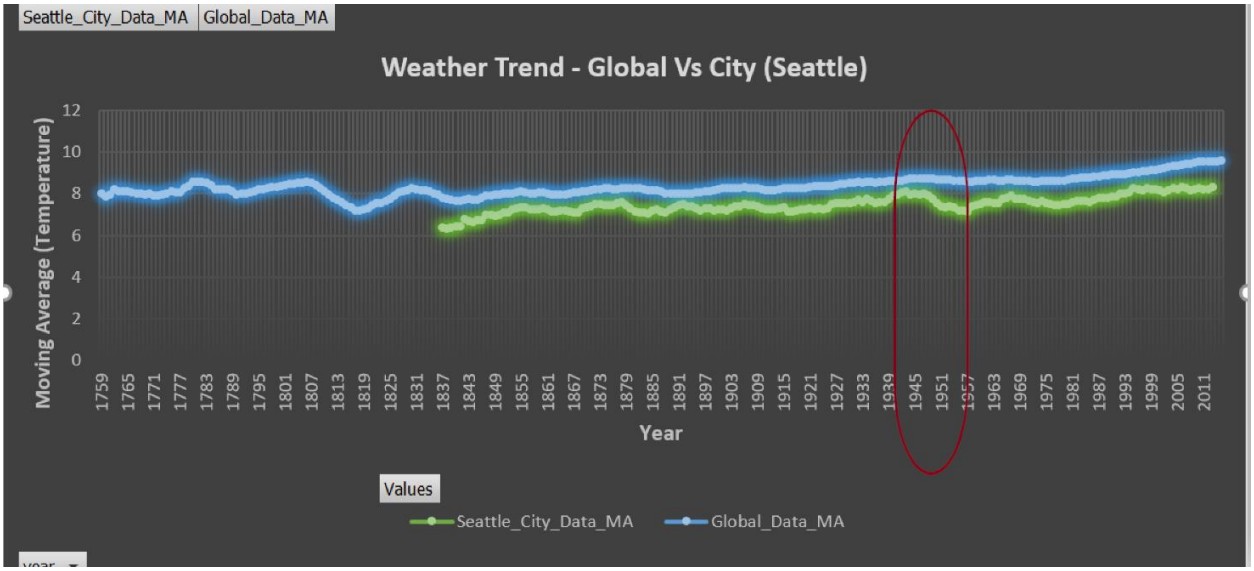
4.0 Observations (Comparing Global temperature Trend Vs City temperature Trend)

Observation #1: Seattle is cool.

Seattle seems to be cooler, when compared to global temperature. Below is the Maximum and Minimum Moving average temperature data for both Seattle (City) and Global to prove Seattle is cooler. Seattle's observation (Maximum and Minimum) is lower than Global data observation.

	Seattle City	Global
Maximum Moving Avg. Temperature	8.339	9.594
Minimum Moving Avg. Temperature	6.423	7.203

Observation #2: Steady drop in Seattle Temperature from 1945 to 1957



For Seattle City, from 1945 to 1957, it seems there is a sharp decline in temperature for Seattle, when compared to global temperature data. In 1947, the Moving Avg. is around 8.045 but in 1957, it dropped to 7.133. For Global, there is no sharp decline in the specified period.

Year	Seattle Moving Avg.	Global Moving Avg.
1947	8.045	8.755
1948	7.901	8.744
1949	7.781	8.727
1950	7.577	8.688
1951	7.427	8.674

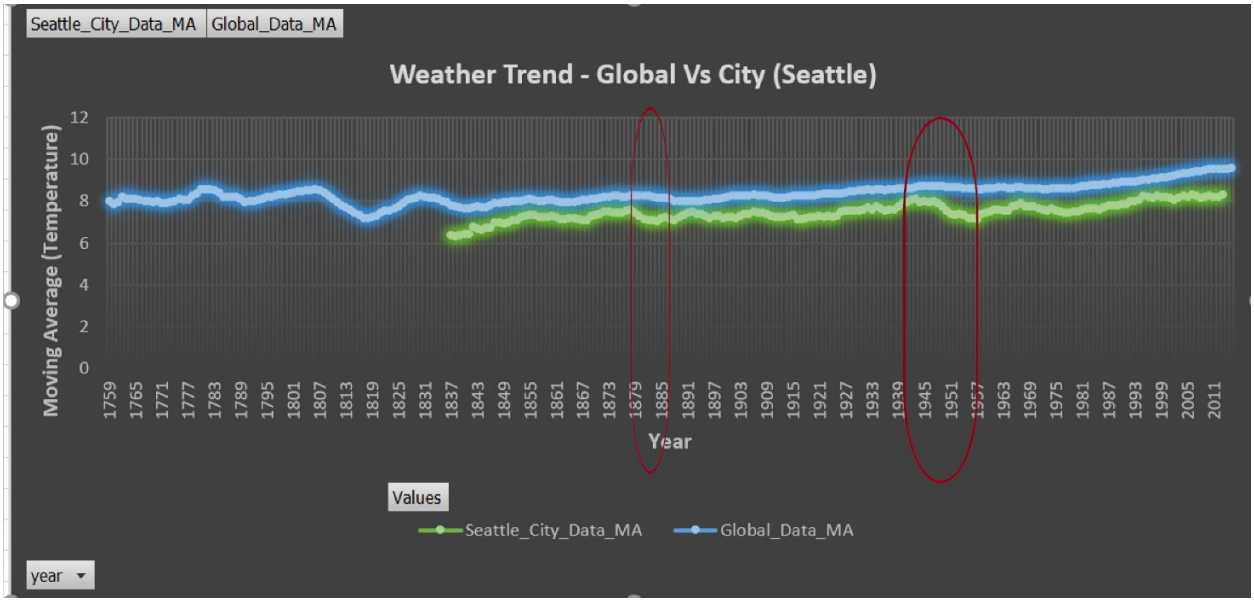
1952	7.373	8.665
1953	7.433	8.676
1954	7.353	8.647
1955	7.205	8.652
1956	7.184	8.612
1957	7.133	8.605

Observation #3: Rate of temperature change in recent years (2002 to 2013).

Looks like in recent years, both Seattle and Global temperature continues to raise. Though Seattle's temperature raise is slightly lesser compared to Global, rate of change is above 3% for both Seattle and Global. **So the world is getting hotter.**

	Seattle Moving Avg.	Global Moving Avg.
Year: 2002	8.081	9.249
Year: 2013	8.336	9.556
Rate of Change	**+3.15%**	**+3.319%**

Observation #4: Overall Trend.



Overall Seattle (City) seems to closely follow the global trend in terms of temperature raise, even though Seattle seems to have minor dips in some periods as highlighted in the above chart. (Periods: 1878 to 1884, 1945 to 1957).